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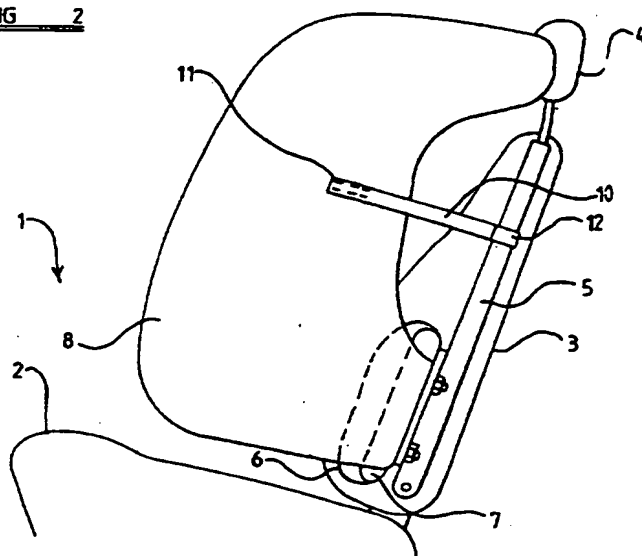
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GB 2293355 A GB 2261636 A EP 0673807 A2

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(54) Abstract Title
Positioning of inflated airbag.

(57) The airbag 8 is mounted to a gas generator 6 by trapping the bag fabric between the generator and the mounting plate (9, Fig. 1). To ensure correct positioning of the airbag upon inflation a strap 10 is secured 11 to the airbag and the other end of the strap 12 is attached to a support means such a seat frame 5 at a position spaced from the gas generator. In one embodiment the strap is secured to the frame 5 of the seat in a manner that it can slide as the airbag inflates. In other embodiments (Figs. 4, 5) the strap may be connected to an arm (13) extending from the airbag module or the strap may be slidably connected to an arm (14) extending from the module mounting plate (9).

FIG 2



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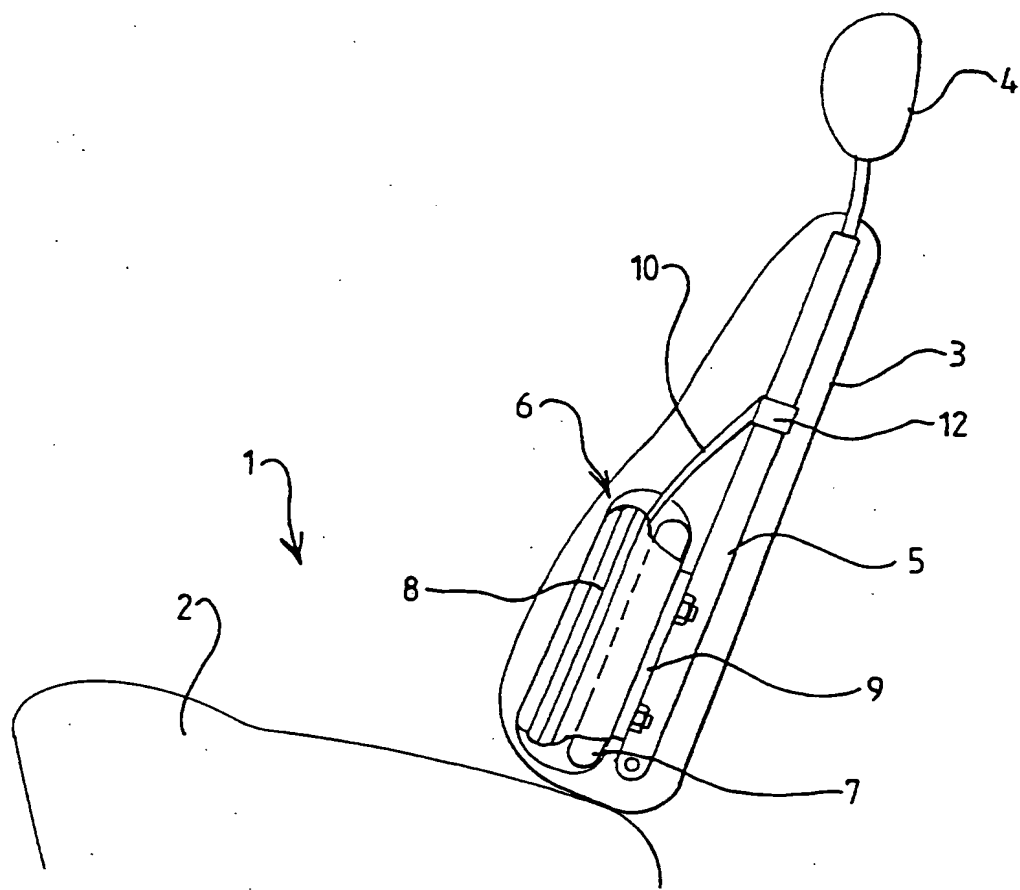


FIG 1

FIG 2

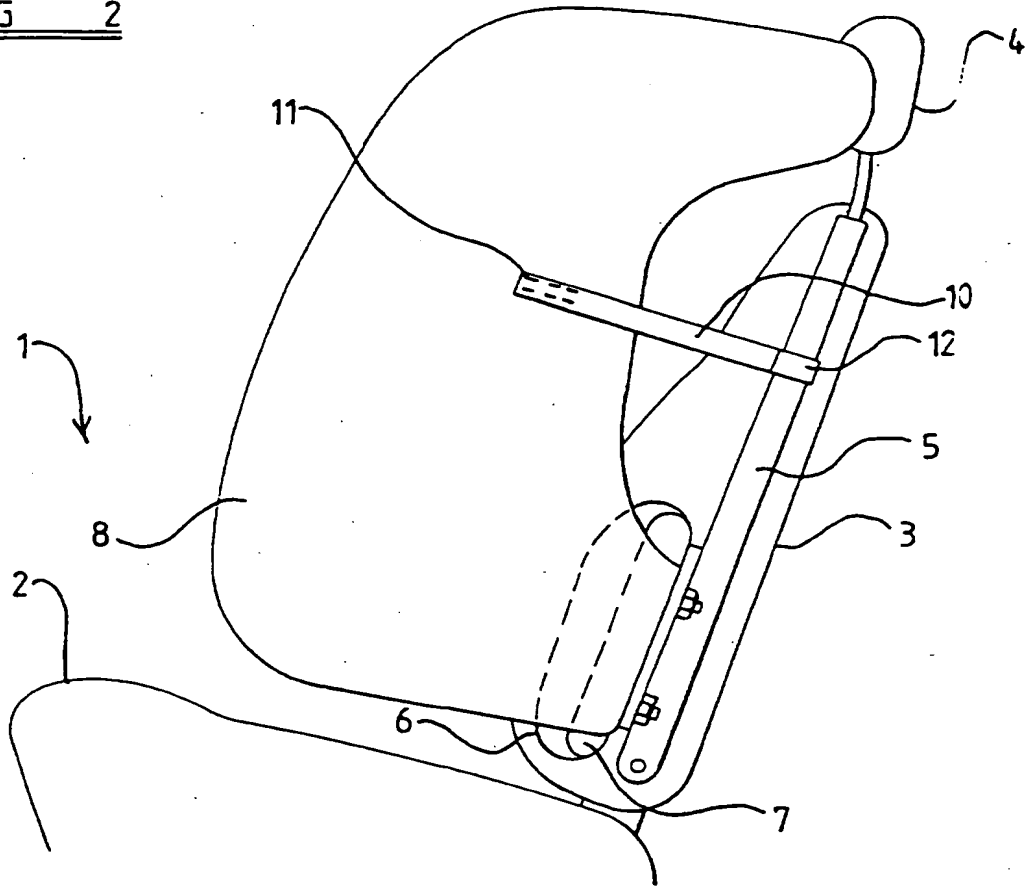


FIG 3

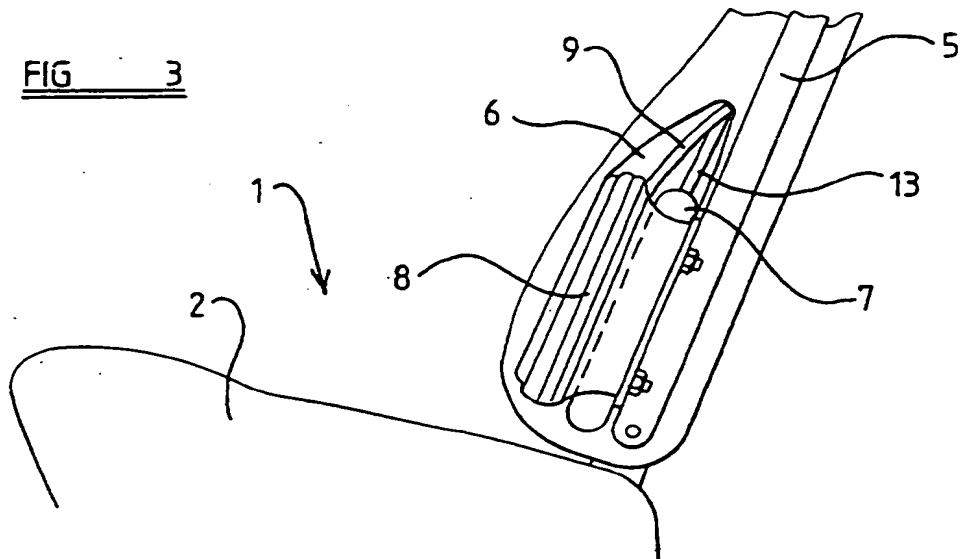


FIG 4

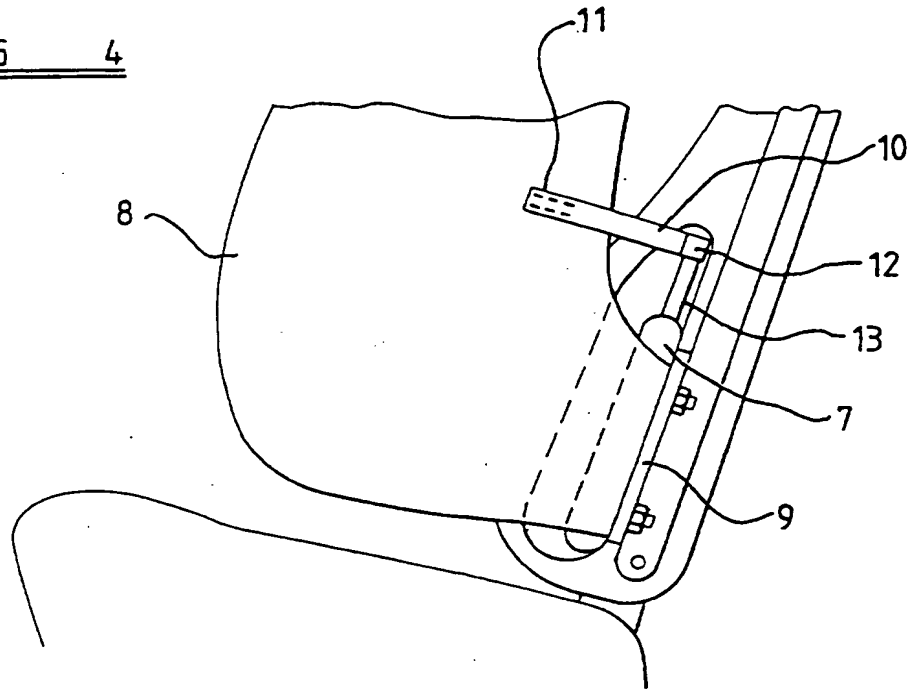
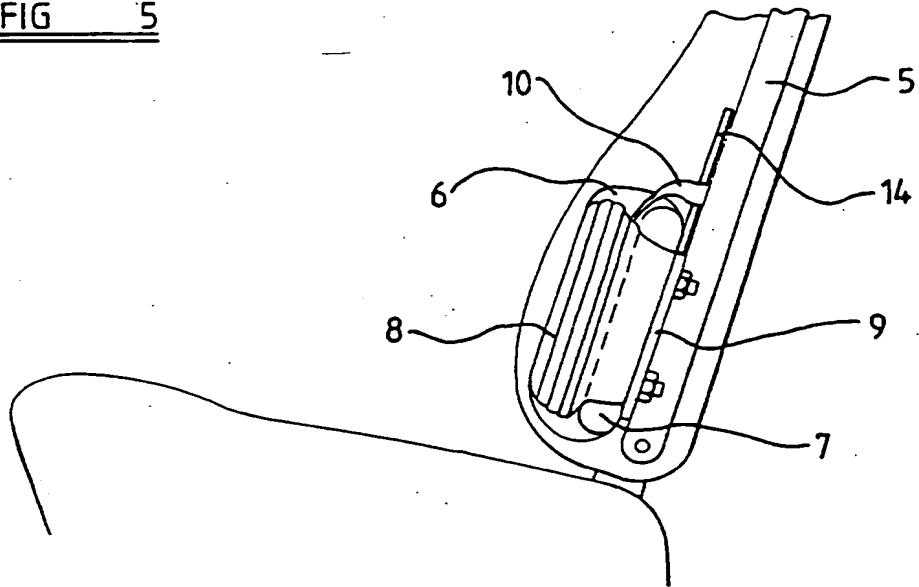


FIG 5



2322338

PATENTS ACT 1997
P11225GB-NF/jsd

DESCRIPTION OF INVENTION

"IMPROVEMENTS IN OR RELATING TO AN AIR-BAG ARRANGEMENT"

THE PRESENT INVENTION relates to an air-bag arrangement, and more particularly relates to an air-bag arrangement adapted to be incorporated into part of a vehicle seat.

It has been proposed previously to provide an air-bag which is initially mounted in the uninflated state in the back of the seat of a motor vehicle, the air-bag, when inflated, being adapted to be positioned between the torso of the occupant of the seat and the adjacent door or side-part of the vehicle. The air-bag is provided with a gas generator adapted to inflate the air-bag, the gas generator being triggered, typically, by means responsive to a side impact. Thus, should a side impact occur, the air-bag is inflated and is located between the door or side of the vehicle and the occupant of the vehicle.

Typically, such an air-bag is initially contained within a module which is located in the lower part of the back of the seat. On inflation of the air-bag, the air-bag itself emerges through part of the seat. The air-bag is shaped so that the air-bag occupies an appropriate position adjacent the torso of the occupant of the vehicle. The air-bag may extend the full height of the side of the seat and may incorporate an enlargement at the upper end of the air-bag adapted to be aligned with the head of the occupant of the seat. It is possible that the air-bag may not position itself correctly, which is hardly surprising since

the air-bag is really only supported and located by a relatively small part of the air-bag which is connected to the gas generator which is mounted in the lower part of the back of the seat, and the air-bag may thus adopt an incorrect position.

The present invention seeks to provide an improved air-bag arrangement.

According to this invention there is provided an air-bag arrangement incorporated in a seat of a motor vehicle, the air-bag arrangement comprising a part of the air-bag being fixed in position, the air-bag being a gas generator and an air-bag adapted to be inflated by the gas generator, there being an elongate element secured to the air-bag and extending from the air-bag to support means, the arrangement being such that when the air-bag is inflated by gas from the gas generator, the elongate element extends from the inflated air-bag to a point on the support means which is spaced from the port of the air-bag that is fixed in position.

Preferably the air-bag is initially mounted in the back-rest of the seat, the air-bag, when inflated, being adapted to be located between at least the torso of an occupant of the seat and the adjacent side or door of the vehicle.

Conveniently the support means to which the elongate element is connected comprise or are mounted directly on a frame forming part of the back of the seat.

Preferably the air-bag is initially contained within a module. Advantageously the module comprises two hingedly connected cover element.

Advantageously the support means comprise a support element which comprises part of the module, the module thus comprising the gas generator, the air-bag, the elongate element and the support element as an integral unit.

Preferably the support means comprise a support element formed integrally with a mounting plate by means of which the module is mounted to a frame forming part of the seat.

In a preferred embodiment the part of the elongate element connected to the support means is slidably mounted in position so that, as the air-bag inflates, the part of the elongate element connected to the support means slides from an initial position to a final position.

Conveniently the elongate element is a strap.

Preferably the part of the air-bag that is fixed in position is connected to the gas generator.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a side view of a vehicle seat provided with an air-bag arrangement in accordance with the invention, with parts of the seat being cut away for the sake of clarity of illustration,

FIGURE 2 is a view corresponding to Figure 1, but illustrating the air-bag in the inflated position,

FIGURE 3 is a view corresponding to Figure 1, but with part thereof cut away, illustrating a modified embodiment of the invention,

FIGURE 4 is a view corresponding to Figure 1, but with part thereof cut away, illustrating the air-bag of Figure 3 when in the inflated position,

FIGURE 5 is a view corresponding to Figure 1, but with part thereof cut away illustrating a third embodiment of the invention.

Referring now to Figure 1 of the accompanying drawings, a vehicle seat 1 is provided, the seat having a squab 2, a back 3 and a head-rest 4 provided at the top of the back 3 of the seat. The back 3 of the seat is provided with an inverted "U"-shaped rigid frame 5. Mounted on the frame 5, at one side of the seat, is an air-bag module 6. The air-bag module 6, which may comprise two cover elements which are hingedly connected, contains an elongate gas generator 7, which is located in a substantially vertical orientation. Part of the gas generator is surrounded by an air-bag 8 which is initially in a folded condition. Part of the air-bag 8 is fixed in position by being connected to the gas generator 7 in such a way that gas from the gas generator 7 will inflate the air-bag 8. In the illustrated embodiment the gas generator 7 is connected, by screws, to a mounting plate 9 with part of the fabric of the air-bag being trapped between the gas generator 7 and the plate 9 to connect the air-bag to the gas generator 7.

The module 6 is mounted on the frame 5 by means of the mounting plate 9.

A strap 10 or other elongate flexible element is provided having one end 11 (see Figure 2) secured to part of the air-bag 8, and having the other end 12 secured to one side arm of the inverted "U"-shaped frame 5.

The gas generator 7 is associated with a crash sensor which, in this example, responds to a side impact. In the event that a side impact occurs, the gas generator is activated, generating gas to inflate the air-bag 8. The two cover elements of the module 6 open to permit the air-bag 8 to emerge from the module 6 and occupy the inflated position, as shown in Figure 2. The air-bag is retained in position by the part of the air-bag that is fixed in position. It can be observed that when the air-bag is inflated the strap 10 extends from the inflated air-bag to the inverted "U"-shaped frame 5. The frame 5 acts as a support means, and the combination of the frame and the strap helps to maintain the inflated air-bag in the desired position which is beside the torso and head of an occupant of the seat (not shown) with the inflated bag 8 thus being located between the principal body and head parts of the occupant of the seat and the side of the vehicle.

Whilst, in the described embodiment, the end 12 of the strap 10 was secured to one side arm of the frame 5, it is envisaged that in an alternative embodiment of the invention, the end 12 of the strap that is to be connected to the frame 5 may be slidably mounted in position so that, as the air-bag inflates, the end 12 of the strap 10 slides from an initial position to a final position. Thus, the end 12 of the strap 10 may be mounted on a slide rail which is mounted on the frame 5, or may be mounted in position in some other convenient way.

Figure 3 illustrates a modified embodiment of the invention. Many features of this embodiment are identical with those of the embodiment of Figure 1 and are identified by the identical reference numerals.

It is to be noted that in this embodiment of the invention, the strap 10 is not connected to the frame 5, but instead is connected to an arm 13 which extends from the gas generator 7, but which is initially contained within the module 6. It is thus to be appreciated that in fabricating a seat according to Figure 3, initially the module 6 may be fabricated including the gas generator 7, the folded air-bag 8, the strap 10 and the arm 13. The completely-assembled module 6 may then be mounted in position on the frame 5 of the back 3 of the seat.

Figure 4 illustrates the embodiment of Figure 3 when the air-bag 8 is in the inflated position. It can be seen that the strap 10 of the embodiment shown in Figure 4 is slightly shorter than the strap of the embodiment shown in Figures 1 and 2, and also the end 12 of the strap 10 which is connected to the support means constituted by the arm 13 is closer to the gas generator 7 than in the embodiment of Figures 1 and 2. Nevertheless, the support means and the strap 10 will assist in ensuring that the bag 8 is, when inflated, in the desired position.

It is to be appreciated that the end 12 of the strap 10 that is connected to the arm 13 may be slidably connected to the arm 13, so that the strap slides along the arm 13, as the bag inflates, from an initial position to a final position.

Figure 5 illustrates yet another embodiment of the invention. The frame 5 of the seat carries the mounting

plate 9, which has an extending arm 14. A module 6 containing a gas generator 7 and a folded air-bag 8 is mounted on the fixing plate. The strap 10, one end of which is connected to the air-bag 8, extends from the module 6 and is slidably engaged with the arm 14. The arm 14 acts as the support means for the strap 10 as the bag is inflated.

It is to be appreciated that as the air-bag 8 of the embodiment of Figure 5 is inflated, the strap 9 will initially slide along the support arm 15, but will, when the bag is fully inflated, extend from the support arm 15 to a point on the inflated bag to hold the inflated bag in the desired position.

Whilst the invention has been described with reference to preferred embodiments, it is to be appreciated that modifications may be effected to the embodiments described without departing from the scope of the invention which is defined by the following Claims. For example, while the air-bag has been described as being initially retained in a module having two hinged cover elements, the air-bag could be retained in other ways, for example by a breakable strap or a rupturable bag.

CLAIMS:

1. An air-bag arrangement incorporated in a seat of a motor vehicle, the air-bag arrangement comprising a part of the air-bag being fixed in position, the air-bag being a gas generator and an air-bag adapted to be inflated by the gas generator, there being an elongate element secured to the air-bag and extending from the air-bag to support means, the arrangement being such that when the air-bag is inflated by gas from the gas generator, the elongate element extends from the inflated air-bag to a point on the support means which is spaced from the port of the air-bag that is fixed in position.
2. An arrangement according to Claim 1 wherein the air-bag is initially mounted in the back-rest of the seat, the air-bag, when inflated, being adapted to be located between at least the torso of an occupant of the seat and the adjacent side or door of the vehicle.
3. An arrangement according to Claim 2 wherein the support means to which the elongate element is connected comprise or are mounted directly on a frame forming part of the back of the seat.
4. An arrangement according to Claim 1, 2 and 3 wherein the air-bag is initially contained within a module.
5. An arrangement according to Claim 4 wherein the module comprises two hingedly connected cover elements.
6. An arrangement according to Claim 4 or 5 as dependent upon Claim 1 or Claim 2 wherein the support means

comprise a support element which comprises part of the module, the module thus comprising the gas generator, the air-bag, the elongate element and the support element as an integral unit.

7. An arrangement according to Claim 4 or 5 as dependent upon Claim 1 or Claim 2 wherein the support means comprise a support element formed integrally with a mounting plate by means of which the module is mounted to a frame forming part of the seat.

8. An arrangement according to any one the preceding Claims wherein the part of the elongate element connected to the support means is slidably mounted in position so that, as the air-bag inflates, the part of the elongate element connected to the support means slides from an initial position to a final position.

9. An arrangement according to any one of the preceding Claims wherein the elongate element is a strap.

10. An arrangement according to any one of the preceding Claims wherein the part of the air-bag that is fixed in position is connected to the gas generator.

11. An air-bag arrangement substantially as herein described with reference to and as shown in Figures 1 and 2 of the accompanying drawings.

12. An air-bag arrangement substantially as herein described with reference to and as shown in Figures 3 and 4 of the accompanying drawings.

13. An air-bag arrangement substantially as herein described with reference to and as shown in Figure 5 of the accompanying drawings.

14. Any novel feature or combination of features disclosed herein.



The
Patent
Office

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Application No: GB 9703516.6
Claims searched: 1-13

Examiner: J. C. Barnes-Paddock
Date of search: 30 April 1997

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B7B (BSB)

Int Cl (Ed.6): B60R 21/16, 22

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2,293,355 A (ALLIEDSIGNAL) See Fig. 9d. Two point attachment to a seat frame.	1-3, 9, 10
A	GB 2,261,636 A (TAKATA) See Fig. 17 and the bottom para, page 13. A vehicle body mounted airbag, its position controlled by straps.	
X	EP 0,673,807 A2 (TRW) See Fig. 13 and page 11, lines 29-36 and 54-58. Seat mounted airbag positioned by two external tethers.	1-5,9,10

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

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E Patent document published on or after, but with priority date earlier than, the filing date of this application.